

	Type	Hits	Search Text
1	BRS	15	((composite or matrix or blend or dispersant) same endothermic) and (252/s.ccls. and endothermic and (composite or matrix or blend or dispersant)) and ((phase adj change) or pcm)

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CLASS 165, HEAT EXCHANGE

CLASS DEFINITION

This class includes apparatus or process not provided for in other classes for transferring heat, or apparatus or process not provided for in other classes relating to an auxiliary device particularly adapted to be used with such heat transfer apparatus.

(1) Note. A patent including a claim having nominal recitation of structure external to this class in combination with significantly claimed heat transfer apparatus of this class is included in this class. A patent including a claim having significant recitation of structure external to this class is excluded from this class unless specifically provided for in this class. See Subclass References to the Current Class, below, for a subclass reference for a combination of a vehicle structure and significantly claimed heat transfer apparatus, and for a combination of a building structure and significantly claimed heat transfer apparatus.

(2) Note. Method of repairing, making, or assembling a heat exchanger is not provided in this class but is classified in an appropriate manufacturing class.

(3) Note. Any process claim appropriate for this class are classified in the subclass providing for structure used in the process.

SUBCLASS REFERENCES TO THE CURRENT CLASS

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 3, for heating and cooling including addition or removal of water vapor from air.
- 41+, for a combination of a vehicle structure and significantly claimed heat transfer apparatus.
- 47+, for a combination of a building structure and significantly claimed heat transfer apparatus.
- 58, and 200, see note for the line between Classes 62 and 165.
- 58+, for a heating and cooling system with an ancillary separator.
- 200, see "note " for the line between Class 165 and related art.

REFERENCES TO OTHER CLASSES

SEE OR SEARCH CLASS:

- 34, Drying and Gas or Vapor Contact With Solids, appropriate subclasses. See Lines With Other Classes and Within This Class in the class definition of Class 34 for the line.
- 62, Refrigeration, appropriate subclasses, for processes limited to refrigeration and

apparatus having features specialized to refrigeration. In general if the heat exchanging means is such that it is adapted for interchangeably or convertibly heating or cooling it is not specialized to refrigeration. For example, features such as ice supports, material phase changing means (refrigeration producers), atmospheric condensate handling or an article handler with means peculiar to refrigerating the article would be considered specialized to refrigeration. As to structure adapted to both heat and cool, see Subclass References to the Current Class in this class (165). See Subclass References to the Current Class for a subclass reference to the line between Classes 62 and 165.

- 65, Glass Manufacturing, subclass 512 for specialized cooling of newly formed glass fibers or filaments; subclasses 509 + for specialized heating of newly formed glass fibers or filaments; subclasses 348 + for means specialized to the cooling of manufactured glass products; subclasses 484 + for means specialized to exchange heat in a fiber or filament forming operation and appropriate subclasses for processes or means specialized to the application of or removal of heat in glass manufacturing.
- 95, Gas Separation: Processes, for processes of gas separation including heat exchange. Cold wall-hot wall thermal diffusion processes will be found in Class 95, subclass 289. Class 165 will take processes where only indirect heat exchange is involved, whether or not gas separation is said to occur. See Subclass References to the Current Class in this class (165) for a subclass reference for heating and cooling including addition or removal of water vapor from air.
- 96, Gas Separation: Apparatus, for apparatus for gas separation including a heat exchanger. Cold wall-hot wall thermal diffusion apparatus will be found in Class 96, subclass 221. Class 165 will take apparatus where only indirect heat exchange is involved, whether or not gas separation is said to occur. See Subclass References to the Current Class in this class (165) for a heating and cooling system with an ancillary separator.
- 99, Foods and Beverages: Apparatus, appropriate subclasses for food treating apparatus having heating or cooling means combined with additional apparatus specialized to food.
- 100, Presses, subclass 92 for presses means to heat, cool or dry the material.
- 122, Liquid Heaters and Vaporizers, subclass 32 for an indirectly heated closed liquid container with an internal vapor separator, and appropriate subclasses for a closed liquid heating vessel with a heat generator and for an accessory or element that of necessity must form a part of the liquid heating combination.
- 126, Stoves and Furnaces, subclass 33 for a stove with a steam table; subclasses 204 + for a body warmer; subclasses 226 + for a tool heater; subclass 247 for a frictional heater; subclasses 263.01 + for a chemical reaction type heater; subclasses 561 +, 569 + and 714 for a solar heater; subclass 343.5 for a melting furnace; and appropriate subclasses, for open liquid heating structures not equally adapted for cooling, for heating stoves, for means for the application of heat for house warming and cooking purposes, and for specialized accessories and elements of such means.
- 137, Fluid Handling, subclass 334 particularly subclass 340 for fluid handling

apparatus combined with means to heat or cool a part of the system or its contents by a heat exchange.

- 138, Pipes and Tubular Conduits, subclass 37 for general utility pipe having flow regulator or baffle.
- 159, Concentrating Evaporators, appropriate subclasses, for means for the generation and transfer of heat of the specific purpose of concentration by evaporation.
- 196, Mineral Oils: Apparatus, subclass 104 for a still designed for mineral oil distillation and subclasses 138 + for condensing peculiarly adapted and limited to the mineral oil art.
- 202, Distillation: Apparatus, subclass 163 and 232 + for apparatus for volatilizing a substance for the purpose of recovering material from the vapor by condensation or absorption.
- 203, Distillation: Processes, Separatory, subclass 41 and 42, for a process of volatilizing a substance and recovering material from the vapor by some type of sorption.
- 210, Liquid Purification or Separation, subclass 175 , 612 +, 664, 737, 742, 766, and 774 for processes and apparatus of that class with heat or heat exchange.
- 219, Electric Heating, appropriate subclasses for an electric heater or an electrically heated tool.
- 221, Article Dispensing, subclass 150 for subject matter of that class with cooling or heating.
- 222, Dispensing, subclass 146 for dispensers with heating or cooling means.
- 236, Automatic Temperature and Humidity Regulation, subclass 44 for automatic humidity controlling mechanism; subclass 46 for temperature or a humidity controlling mechanism including a timing means; and appropriate subclasses for a temperature or humidity control mechanism for a control of general utility. The line between Class 165 and 236 is: Class 165 takes: (a) Nominal recitation of a means for heating and cooling, and a means for automatically controlling the means for heating and cooling. (b) Specific heat exchanger structure in combination with a means for automatically controlling a heat exchanger. (c) Specific heat exchange structure in combination with a means for automatically controlling a heating and a cooling means. Class 236 takes: A patent with nominal recitation of a heat exchanger in combination with a means for automatically controlling a heating or cooling means.
- 237, Heating Systems, subclass 70 for a heat distributing means peculiarly adapted for heating, and appropriate subclasses for (1) a heat producer combined with means for distributing a fluid heated thereby and (2) apparatus including systems for heating a room, chamber, house or other inclosing structure when such apparatus is not equally adapted for cooling. See Subclass References to the Current Class for a subclass reference to the line between Classes 237 and 165.

- 239, Fluid Sprinkling, Spraying, and Diffusing, subclass 13 and 128 + for processes and apparatus of that class with heating or cooling.
- 241, Solid Material Comminution or Disintegration, subclass 23 and 65 + for processes and apparatus of that class with heating or cooling.
- 252, Compositions, particularly subclass 67 and 71 +. Patents are placed in Class 252 (1) claiming admixtures of ingredients, or claims to an old compound limited to use as a heat exchange agent, (2) processes of heat exchange comprising known heat exchange steps broadly recited and distinguished solely by the composition or compound used, and (3) apparatus with the composition or compound therein, where characteristics of apparatus structure are not claimed. The preceding are placed in Class 252 even though freezing or boiling points or temperatures of use are specified.
- 261, Gas and Liquid Contact Apparatus, appropriate subclasses for apparatus specially adapted to produce an intimate contact between gases and liquids to exchange properties or mutually modify conditions; particularly, subclass 127 for a gas liquid contact device with an immediately associated means for externally supplying heat to or removing it from a contact fluid before, after or during contact to perfect the contact operation; and subclasses 158 + for a contact device in which heat is interchanged between contact fluids out of contact before, after or during contact.
- 291, Track Sanders, subclass 19 for subject matter of that class with a heater.
- 312, Supports: Cabinet Structure, subclass 236 for the combination of a cabinet and a heater or heat exchanger, having no feature relating to the promotion or control of the flow of the fluid in the cabinet relative to the heat exchanger.
- 366, Agitating, appropriate subclasses for agitating process or apparatus of general utility; subclass 144 for an agitator in combination with a heating or cooling means. The line between Classes 165 and 366 on combined agitator and heat exchanger is:
Class 165 takes: (a) All patents with significant heat exchange structure in combination with nominal structural recitation of an agitator. (b) All patents with a heat exchanger having an agitator which operates on a working fluid (e.g., a coolant or heating fluid), whether or not the agitator structure is broadly or significantly claimed. (c) All patents with a heat exchanger having a working fluid (e.g., a coolant or heating fluid) which goes through the inside of a movable portion of an agitator, whether or not the agitator structure is broadly or significantly claimed

Exception to the above statements (b) and (c): Patents in which a working fluid is agitated by an agitator and then allowed to be mixed in a mixing chamber containing a material or fluid to be treated (heated or cooled) are classified in Class 366.

Class 366 takes: (a) Significant agitator structure in combination with significant structure of a heat exchanger. (b) Significant agitator structure in combination with nominal structure of a heat exchanger.

Exception to the above statements (a) and (b): A patent with a heat exchanger having a working fluid (a coolant or heating fluid) which goes through the inside of a movable portion of an agitator is classified in Class 165, whether the agitator structure is significantly or broadly claimed. Class 366 takes a heat exchanger

67+, for compositions for refrigeration by vaporization or expansion, or processes of making such compositions.

SEE OR SEARCH CLASS:

- 44, Fuel and Related Compositions, for liquid or solid compositions for producing heat by combustion, especially 250+ for a composition which produces heat by a flameless or glowless chemical reaction which is not readily reversible.
- 48, Gas: Heating and Illuminating, for gaseous fuels.
- 106, Compositions: Coating or Plastic, 13 for coating or plastic composition for preventing fog, frost or ice on a surface.
- 126, Stoves and Furnaces, 263.01+ for chemical heaters.
- 138, Pipes and Tubular Conduits, 34 for pipes with means to introduce an antifreeze substance.
- 523, Synthetic Resins or Natural Rubbers, appropriate subclasses, particularly 169 for a composition containing a synthetic resin or natural rubbers having utility to preserve visibility through a windshield or other optical device by preventing the buildup of fog or rendering the surface hydrophobic thereby causing the surface to repel water or to processes of preparing said composition.

71

HEAT-EXCHANGE, LOW-FREEZING OR POUR POINT, OR HIGH BOILING COMPOSITIONS:

This subclass is indented under the class definition.

Compositions specialized and designed for, or peculiar to, use in heat exchanges or which are low-freezing or high-boiling, or which are adapted to form mixtures having a lower pour-point or freezing point when mixed with other substances.

- (1) Note. Elements other than C and H and compounds which contain such other elements are not considered to be significant in this class, when they originate in and form a part of petroleum or fractions thereof, unless such elements or compounds are recited separately in the claims.
- (2) Note. This subclass provides, inter alia, for (1) claiming admixtures of ingredients, or claims to an old compound limited to use as a heat exchange agent, (2) processes of heat exchange comprising known heat exchange steps broadly recited and distinguished solely by the composition or compound used, and (3) apparatus with the composition or compound therein, where characteristics of apparatus structure are not claimed. The preceding are placed in this class even though freezing or boiling points or temperatures of use are specified.

SEE OR SEARCH THIS CLASS, SUBCLASS:

67+, for fluids for use in expansible-fluid engines.

70, for low temperature eutectic compositions.

570+, for fluent dielectric Compositions ("insulating oils ") which contain a hydrocarbon and a nonhydrocarbon.

SEE OR SEARCH CLASS:

122, Liquid Heaters and Vaporizers, for processes of heating liquids, etc., which may involve the use of compositions classified in this subclass (71) and its indents.

148, Metal Treatment, 27+ for metal treating compositions having a heat-transfer function.

165, Heat Exchange, 104.11+ for a heat exchange device with an intermediate fluent material receiving and discharging heat.

203, Distillation: Processes, Separatory, for processes of heating liquids, etc., which may involve the use of compositions classified in this subclass and its indents.

208, Mineral Oils: Processes and Products, for processes of heating liquids, etc., which may involve the use of compositions classified in this subclass and its indents.

508, Solid Antifriction Devices, Materials Therefor, Lubricant and Separant Compositions for Moving Solid Surfaces, and Miscellaneous Mineral Oil Compositions, for compositions similar to those of this subclass when such compositions are specialized for use as lubricants.

72 With leak-stopping agents:

This subclass is indented under subclass 71.

Compositions which contain agents for stopping or reducing leaks in containers.

SEE OR SEARCH CLASS:

106, Compositions: Coating or Plastic, 33 for leak stopping compositions, per se.

73 Organic components:

This subclass is indented under subclass 71.

Compositions which contain organic compounds.